REMARKS

Applicant respectfully request favorable reconsideration of this application. Claims 1-10 are pending.

Claim Rejections - 35 USC § 103

Claims 1-10 were rejected under 35 USC 103(a) as being unpatentable over Okunuki et al. (US 5460179) and further in view of Kanebo (JP 61149128). Applicant respectfully traverses the rejection.

Although claim 7 was included in the rejection as being unpatentable over Okunuki et al. in view of Kanebo, only claims 1-6 and 8-10 were substantively addressed. Okunuki et al. in view of Kanebo do not teach the required features of claim 7. Applicant respectfully requests that this rejection be withdrawn.

Regarding claim 1, the rejection conceded that Okunuki et al. does not teach a medium that includes 1,2-butylene glycol. The rejection also concedes that Kanebo does not remedy this deficiency. Kanebo teaches a composition including 1,3-butylene glycol. The rejection stated that, although Kanebo does not teach 1,2-butylene glycol as an example of polyhydric alcohol that can be used in the composition, because Kanebo teaches a composition including 1,3-butylene glycol, it would have been obvious to one skilled in the art to include 1,2-butylene glycol in a composition and such composition would be combinable with the device as taught in Okunuki et al. Applicant respectfully disagrees.

Kanebo teaches a composition to be applied between skin and probe that induces no skin irritation (see English Abstract). Kanebo teaches that the composition include the polyhydric alcohol (e.g. 1,3-butylene glycol) to prevent the composition from drying out, thereby improving the adhesion between the skin and the ultrasonic diagnostic probe (page 2, upper left column, lines 14-19). Kanebo teaches that "it is difficult for a composition to stay between a probe and skin, and thus a space is likely to be formed as an air layer, which often results in poor ultrasonic energy propagation" (Prior Art Section of Kanebo). Kanebo teaches that the composition that includes1.4-1.2 wt% carboxyvinyl polymer salt; 0.03-0.8 wt% hydroxyethyl cellulose; 10-80 wt% polyhydric alcohol; and 60-85 wt% water solves this problem and the composition also does not irritate skin (see page 1, lower right column, lines 13-18; also see English Abstract). Accordingly, Kanebo teaches a composition that does not irritate skin and does not form an air layer between the skin and the ultrasonic probe. Accordingly, in view of Miller (Miller, L.M.

"Investigation of selected potential environmental contaminants: ethylene glycols, propylene glycols and butylenes glycols: Final Report" Franklin Research Center, Philadelphia, PA. 01 May 1979, PB-80-109119), even if it would have been obvious to one skilled in the art to substitute 1,2-butylene glycol for 1,3-butylene glycol, which Applicant does not concede, the resulting composition would still be considered useful only for use as taught in Kanebo. The use of the compound according to Kanebo is for application to skin, without causing skin irritation and without forming air layers. Kanebo did not recognize the importance of acoustic characteristics of the composition or its ingredients. Kanebo does not even suggest considering physical characteristics such as, for example, acoustic impedance and/or attenuation of the composition. The composition taught in Kanebo is not intended to be sealed inside a device to be used from within. In contrast, Okunuki teaches a device that stores a liquid compound inside a case, such that the liquid does not contact the skin. Okunuki's device does not have any of the issues that are the subject of the teachings in Kanebo. Thus, filling the device as taught in Okunuki et al. with the composition as taught in Kanebo would be contrary to the stated purpose of the composition in Kanebo. Therefore, there is no motivation to combine the two references.

Further, Kanebo does not in fact teach that "1,3-butylene glycol can keep propagation of ultrasound energy good" as stated in the rejection. Kanebo teaches that the composition "can keep propagation of ultrasonic energy good" (English Abstract). Kanebo teaches that in order to achieve "good" propagation of ultrasonic energy, the composition requires a hydroxyethyl cellulose and a salt of carboxyvinyl polymer, wherein the composition also has a polyhydric alcohol and water (see in Table 1: Example 1, Comparative Example 1, Example 3, and Comparative Example 3). Accordingly, Kanebo does not teach that a polyhydric alcohol is responsible for the "good" ultrasonic energy propagation. Kanebo teaches that it is the hydroxyethyl cellulose and a salt of carboxyvinyl polymer are necessary for the "good" ultrasonic propagation. Thus, one of ordinary skill in the art would not understand from the teaching in Kanebo that 1,3-butylene glycol has "good" propagation of ultrasound energy.

Further, Kanebo does not teach the acoustic impedance of the composition that includes 1,3-butylene glycol. Kanebo does not even suggest that the composition as taught in Kanebo may be used inside an ultrasonic diagnostic apparatus. Thus, there is no motivation for one skilled in the art to combine the skin applicable compound as taught in Kanebo with a device that requires a liquid compound stored inside the device. Without said motivation, there is also no

motivation to substitute 1,2-butylene glycol for 1,3-butylene glycol. For at least the above reasons, claim 1 is not obvious in view of Okunuki et al. and further in view of Kanebo. Claims 2-6 and 8-10 are also not obvious in view of Okunuki et al. and further in view of Kanebo for at least the same reasons as claim 1 from which they depend. Applicant respectfully requests a favorable reconsideration of the claims.

Claim 7 was rejected under 35 USC 103(a) as being unpatentable over Okunuki et al. and Kanebo and further in view of Ludwig (Ludwig, George. *The Velocity of Sound Through Tissues and the Acoustic Impedance of Tissues*, The Journal of the Acoustic Society of America, Nov 1950: (22)(6) 862-866) and in view of Schafer (Schafer, Mark E et al. *Use of Time Delay Spectrometry in Fluid Attenuation Measurement*, Ultrasonics Symposium, 1989: 973-976). Applicant respectfully traverses the rejection.

Ludwig and Shafer do not remedy the deficiencies of Okunuki et al. and Kanebo. Thus, claim 7 is patentable for at least the same reasons as claim 1 from which it depends.

Further, the rejection stated that Okunuki et al. teaches that the acoustic medium which the acoustic impedance is roughly equal to that of a living body with room temperature being inherent and the device producing an ultrasound at a frequency of 3 MHz. Applicant respectfully disagrees. The rejection erroneously stated that in column 2, lines 25-29, Okunuki et al. teaches a device that produces an ultrasound at a frequency of 3 MHz. Okunuki et al., in fact, discloses the following in column 2, lines 25-29:

> "...[a plurality of ultrasonic] transducer elements is [*sic*] swung mechanically for mechanical scanning in the arrow direction A within a casing 10. In accordance with this transducer assembly 16, the electronic scanning plane S1 can be produced by electronically scanning the array transducer. In addition, the three-dimensional..."

Thus, Okunuki et al. does not teach a device that produces an ultrasound at a frequency of 3 MHz. In fact, Okunuki et al. does not even mention the word "frequency." Further, Ludwig teaches that the acoustic impedance of human tissue is 1.58 to 1.70 MRayl. Further, although not directly relied upon in the rejection, page 4 of Anderson, Bonita (*Echocardiography: The Normal Examination and Echocardiographic Measurements,* Blackwell Publishing, 2000) was cited to support the acoustic impedance calculation used in the office action. Anderson teaches

that the average soft tissue has an acoustic impedance of 1.63 MRayl. In contrast, claim 7 requires a medium having an acoustic impedance of 1.45 to 1.517 MRayl. The range of acoustic impedance taught in Ludwig and stated in Anderson are clearly outside the claimed range. Further, Schafer merely teaches a general tendency of frequencies and attenuation values without any teachings of specific range. Therefore, Ludwig and Schafer do not teach the required features of claim 7 and fail to remedy the deficiencies of Okunuki et al. and Kanebo. Claim 7 is not obvious in view of Okunuki et al. and Kanebo and further in view of Ludwig and in view of Schafer. Applicant respectfully requests a favorable reconsideration of claim 7.

In view of the above amendments and remarks, Applicant respectfully requests a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned attorney-of record, Douglas P. Mueller (Reg. No. 30,300), at (612) 455-3804.

Respectfully submitted,

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